

## B. 1830-1880

### 1. Agricultural Production

The 70 New Castle and Kent county farms advertised for sale in 1829 in the Delaware Gazette and American Watchman offer a glimpse of farm sizes at the beginning of the first historic context time period. They averaged just under 227 acres, and were distributed as follows:

1-100 acres	21
101-200 acres	19
201-300 acres	11
301-400 acres	12
401-500 acres	5
501-600 acres	0
Over 601 acres	2

For several reasons, these figures cannot be taken as exemplifying the size of the counties' farms. Farms advertised for sale obviously do not represent all farms. In one way, this appears clearly in the newspaper itself. The advertisements cite the location of 56 of the 70 farms. Of these, 20 (36%) lay in Appoquinimink Hundred; the remainder were distributed fairly evenly across Brandywine, Christiana, Mill Creek, Mispillion, Murderkill, New Castle, Pencader, Red Lion, St. Georges, and White Clay Creek hundreds (Bengston 1992: 4, 6).

Fortunately, other sources supplement the newspapers, providing more accurate and comprehensive information on farm numbers, size, and value. Unfortunately, these sources, principally the United States Census, contain detailed information on farms beginning only in 1850. The total acreage in farms (as defined in Table 1) in Delaware increased almost 10% between 1850 and 1870 (Table 1), at the same time that unimproved acreage on the state's farms decreased from 39.2 to 33.7%. The percentage of New Castle County's total acreage in farmland increased from 80% to 90% over the same period, and in Kent County from 75% to 82% (De Cunzo and Catts 1990: 67-69). Average farm size decreased over the same period, by 20 acres (U. S. Bureau of the Census 1872: 688-689); by 1870 farms smaller than 99 acres predominated in both New Castle and Kent counties (De Cunzo and Catts 1990: 70). The total number of farms in the state rose, however, from 6,063 to 8,749, an increase of 30%. In 1860, "New Castle County had the highest proportion of farms per county (45% of the state's farms). They were proportionately the smallest, averaging only 79 acres per farm... Kent County held...29% of the farms in the state... The average farm size was close to the state average (159 acres per farm) but was twice the size of the average farm in New Castle County" (Siders et al. 1991: 25). Overall, these figures document an intensification and expansion in agriculture in the state during this twenty year period spanning the Civil War.

TABLE 1

**DELAWARE FARMS: NUMBER AND ACREAGE 1850-1870**  
 (Source: U.S. Bureau of Census 1872: 688-689)

				% OF UNIMPROVED LAND IN FARMS OF TOTAL LAND IN FARMS		
L A N D  I N  F A R M S	T O T A L	1870	1,052,322	1870	33.7%	
		1860	1,004,295	1860	36.6%	
		1850	956,144	1850	39.2%	
	I M P R O V E D	1870	698,115	<hr/> <hr/>		
		1860	637,065			
		1850	580,862			
					AVERAGE SIZE OF FARMS IN ACRES	
	U N I M P R O V E D			1870	138	
		1870	354,207	1860	151	
		1860	367,230	1850	158	
1850		375,282				

These statistics document the successes of an agricultural reform movement that reinvigorated and redefined Delaware agriculture and farm communities beginning about 1830. New Castle County especially benefited in the early years from its location near large cities, its rich soil, the rivers, canal, and railroads that provided transportation, and an active agricultural society encouraging experiments with drainage, fertilizers, and machinery. Progress was slower in Kent County, its land less fertile, transportation less accessible, and improvements in drainage, fertilizing, and mechanization slower in spreading (Hancock 1947: 375-376; see also Passmore, Maske, and Harris 1978: 17-18; Siders et al. 1991: 102-103).

The substantial gain in production achieved by 1860 in New Castle County would not have been possible unless the latest devices of the time in scientific farming had been employed. From observation, reading, and experiment farmers became convinced of the importance of fertilizers, drainage, and machines. The first lime kiln in Delaware...established...in 1831, introduced a "new era."... The value of marl and guano was also recognized...

...Lands heavily strewn with lime, guano, or manure, which once yielded five or ten bushels of wheat or corn, returned forty or fifty bushels a few years later...

The increase in the price of land was considered "astounding." By 1846 land in New Castle County that had sold for \$10 to \$20 per acre ten years before brought \$40 to \$60 after lime or guano had been used, and many farmers refused to sell at any price (Hancock 1947: 378-379).

For the farmers who could afford to purchase it, the new equipment of the mid-nineteenth century allowed Delaware farmers to work the land more efficiently. They also changed their owners' farming practices in other ways, affecting livestock holdings. "Horse-power was applied to grinders, threshers, corn shellers, hay balers, gins, mowers, hay rakes and reapers" (Siders et al. 1991: 102). Horses were more expensive to maintain than oxen and mules, thus "the acquisition of such machinery...required significant investment in addition to the purchase of the equipment" (Siders et al. 1991: 102).

Crop and livestock diversification also resulted from the agricultural reform program. Vegetables and specialty poultry breeds numbered among these introductions, garnering many of the awards given at the Kent County Agricultural Fairs in the 1850s (Siders et al. 1991: 103).

Jack Michel's quantitative study of a random sample of 1,576 Delaware farms drawn from the 1850 Census of Agriculture, 150 probate inventories from New Castle and Kent counties dated between 1845 and 1855, and a sample of 1,200 farm families from the 1850 Census of Population has produced a more detailed reconstruction of the state and structure of farming in New Castle and Kent counties at mid-century, just before railroad's extension south through the state allowed the transformation of Delaware agriculture. Michel describes the individual, if "average" farm and farmer, with a focus on delineating and explicating regional variability (Michel 1984, 1985).

...[I]n 1850, th[e] first American agricultural revolution was still very incomplete. Farms in the northern part of the state were among the most progressive in the country. But change had barely reached to farms in the central and southern parts of the state. In coming decades, new competition from the corn belt fueled further improvements which transformed farming life throughout the state...

The most obvious fact of mid-nineteenth century Delaware agriculture was its regional variation. Delaware farmers still produced the basic food for their families. In some places farms were still subsistence farms. Farming was still mixed farming, and many farmers grew a bread grain, two or three fodder crops, and raised several kinds of livestock...

These regional differences were determined by the structure of the regional agricultural market: that is, by the demand for and prices of farm products; by the relative costs of farm inputs--capital, labor, land; and by the state of farm and transportation technologies... The economic effects of...differences in land capabilities and transport costs are graphically evident in the geographic variation of land values... As a general rule, land values declined steadily from North to South. In the northernmost hundreds, along the Pennsylvania border, land was worth about sixty dollars an acre, and the very best lands, the marshes and drained fields of New Castle Hundred, might bring \$100 or more an acre. In the central part of the state, in southern New Castle County and throughout Kent County, land values declined to about twelve dollars an acre...

The northern farms were the most intensively cultivated in the state. More than three-quarters of the farmland in this region was improved, and the average farmer here tilled two-thirds or more of his improved land... The average northern farmer owned more than \$150 of tools and machinery... In addition to basic hand tools...this sum allowed him to purchase four or more plows, often of modern, patented design. Most of these farmers had fans worth twenty dollars or more with which to clean grains. Some had horse-drawn threshers

and hay rakes. Many farmers in these regions had horse-drawn cultivators... Finally, a substantial number of northern farmers participated in the field reforms of mid-century, sowing clover and grasses...

Only the rare farmer in...[the southern hundreds] participated in the agricultural reforms of his time. Almost no one sowed grass or clover; few farmers grew hay... Livestock still foraged among native grasses for their...keep... Frequently, farms in this region had less than twenty-five dollars in tools and supplies--a sum which usually purchased but a single plow, a harrow and a modest supply of hand tools...

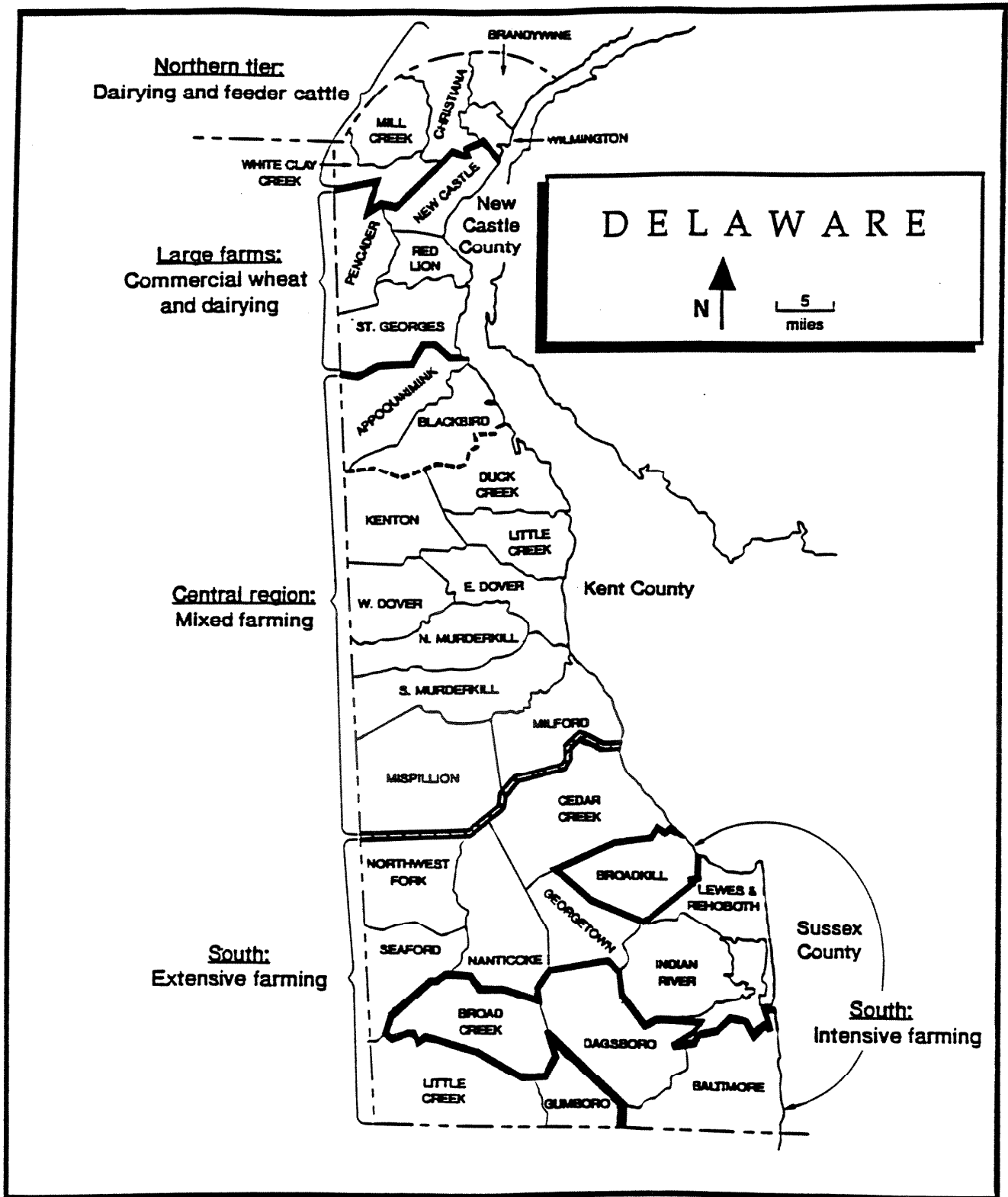
In contrast to northern husbandry, that of the south was relatively extensive. The proportion of the average southern farm which was improved was about the same as in the north, but the average southern farmer tilled only a third of his improved acreage...

[M]id-nineteenth century Delaware can...be divided into five identifiable agricultural ecosystems: (1) a northern tier along the Pennsylvania border characterized by capital intensive dairying and feeder cattle production; (2) a large farm region in southern New Castle County characterized by the large scale cultivation of wheat and dairying; (3) a central region characterized by mixed farming directed first to the subsistence of the farm family, and second to small scale market production of wheat, butter, and livestock; (4) a region of southern intensive farming in eastern Sussex County...; (5) a southern extensive region...[Figure 12].

The commercial production of wheat was concentrated in eight northern hundreds... In the northernmost hundreds... five percent of the sample census farms produced more than 500 bushels of wheat in 1849. And in the heart of the Delaware wheat belt, in St. George's Hundred, a full forty percent of the sample farms produced more than that amount... South of the St. George's-Appoquinimink border, the cultivation of wheat was sharply de-emphasized. The average production of wheat per improved acre fell immediately to one bushel or less...

Indian Corn was the basic source of animal food and fodder in mid-nineteenth century Delaware... Farmers in most hundreds produced between forty and fifty-five bushels of corn per animal unit... [An exception was] the hay belt farms of the northern tier, where the corn production per animal unit was the lowest of any in the state. Here, hay and oats were used as the primary diet for animals, making beasts on these farms the fattest and most productive in the state...

MAP OF DELAWARE, WITH HUNDREDS, SHOWING FIVE  
AGRICULTURAL-ECOLOGICAL REGIONS, 1850  
(BASED ON MICHEL 1984, 1985)



...[T]he production of hay per improved acre and the proportion of tillage allocated to hay was higher...[here] than elsewhere in the state, and the production of oats per farm and per improved acre was second only to that in the large farm belt... Although the mix of the three crops varied considerably from farm-to-farm and from hundred-to-hundred in the region...the normal farmer in the northern tier planted between ten and twelve acres in Indian Corn, between ten and twenty in oats, and a similar acreage in hay.... [Farmers in the large farm region de-emphasized the cultivation of hay.] By contrast, these farmers typically laid between twenty and forty acres per farm to Indian Corn... Farmers in these hundreds also planted the largest acreages in oats...

...Central farms produced about forty bushels of corn per animal unit... But the central region farmer grew substantially less hay and oats... Less than half of all central region farms raised hay... Farmers in these central hundreds also grew oats, but the average farmer who raised oats, raised only about 100 bushels, almost exactly enough to meet the food needs of two horses...

The lessened production of oats and hay in the central region can be attributed to four factors. First, farmers in this region were less concentrated in dairying and beef cattle fattening than in the northern wheat belt hundreds; therefore, their need for hay was less. Conversely, these farmers were more concentrated in swine than their northern neighbors, increasing their relative demand for corn. Third, large areas of marsh fringed the eastern edges of these hundreds, particularly Duck Creek and Milford. Farmers here probably used marsh rather than field grown hay as a supplement to corn in their animals' diet. Most important, farmers in the central region tilled less than forty percent of their improved acreage...

...The differences in scale of livestock operations and in the relative importance of livestock in the regional agricultural systems were the most important general differences between northern and southern Delaware livestock raising... The capital and labor costs of dairying are relatively great... Profitable dairying...required the raising of proper feed crops...which in turn required a substantial investment in land, machinery, time and labor... Like wheat production, dairying was concentrated in the eight northernmost hundreds.... In each hundred, the average farm had more than five dairy cattle, produced more than 350 pounds of butter in 1849...[see also Jensen 1986: 79-113]. South of St. George's Hundred, the production of butter dropped dramatically. In the central hundreds, about a third of the region's farmers kept one or two milkcows for home use.

Butter yields seem to have averaged about forty pounds per cow in this region, and it is improbable that this third of the region's farms produced any surplus dairy products...

The profits in cattle increase relative to the quality of their keep... Together with their proximity to Philadelphia and Wilmington markets, these characteristics of cattle gave the relatively affluent northern farmer on good lands considerable advantages in the cattle trade. The production of meat cattle was concentrated in the four hayland hundreds of the northern tier... Farmers in the large farm hundreds had slightly larger herds than farmers in the northern tier, but produced fewer cattle per improved acre. In the northern tier hundreds, the average farmer ran about seven cattle, in the large farm belt about ten. In the central hundreds, the number of cattle on the average farm fell to between three and five...

Nearly every Delaware farmer raised some swine. In the eight northernmost hundreds, however, pigs were kept almost exclusively for home use... [T]he typical farm produced a relatively modest five or eight pigs in 1849... In these hundreds, sheep were also relatively unimportant to most farmers... In the four northern-tier hundreds only about ten percent of the sample farms produced sheep in 1849. These flocks were modest in size and generally contained ten or fewer sheep...

...In most central and southern region hundreds, forty percent of farms raised more than ten pigs... Approximately half of all farms in the[se] hundreds [also] kept small flocks [of sheep], typically composed of between six and ten animals... The patterns of small animal production are broadly explained by the general economic characteristics of swine and sheep. Both animals were relatively inexpensive, and both grew to market size relatively quickly...(Michel 1985).

...In the cultivation of wheat...and in the mowing of hay...the horse possessed every advantage but cost over the ox. Even in the raising of corn, the cultivation of which radically altered with the development of the horse-drawn cultivator, which permitted the crop to be planted in closely spaced rows rather than in 6 foot squares, the horse would eventually win out. But the horse was not much good, if the farmer couldn't afford him or use him efficiently by raising larger crops. He gave to the farm on good land with adequate capital, a decisive and geometrically increasing advantage. With each additional horse, such farmers increased the inherent advantages of their land and their capital. That most Delaware farmers used horses where they could is quiet testimony to their need to make their land pay. That only



those in the large farm belt, on the most level and best land in the state could do so effectively, foretold the future...(Michel 1984: 22-23).

There was apparently substantial incentive to introduce technological improvements into Delaware farming in the nineteenth century... The northern farmer...increased his capital investment, in land, in technology, in fertilizer, and other improvements in a search for the most efficient mix of production factors. Within the contours of this improving agriculture, very different forces were playing themselves out in very different ways in northern tier and large farm hundreds.

Four characteristics of the northern tier farms are most important to an understanding of their agricultural ecology in 1850 and the years afterward. First, the quality of land here was marginally less than that of the large farm hundreds. Second, the population density in these hundreds was relatively great, and the average farm size relatively small. Third, these farmers used less labor outside of the family than any other farmers in the state. Fourth, these farmers had the highest investment in machinery of any farmers in Delaware. Fifth, as a consequence of these four factors, northern tier farmers were concentrating in dairying.

The technologically intense cultivation of the region, coupled with the apparent absence of farm labor indicates that the machinery of 1850 allowed the farmer in the northern tier to eliminate off farm labor... The agricultural innovations of the next half century were largely designed to increase efficiency by increasing scale of production. They could not, therefore, benefit the northern tier farmer, unless he could increase his scale of production. Given the high price of land in these hundreds, their increasing industrialization, and the always sluggish market in agricultural land, this was not a practicable alternative for the northern-tier farmer. His only option was to increase the intensity of his production. This is what he did. Increasingly these hundreds turned to dairying, the most capital intensive of all agricultural forms of production. But about 1870, the rural population of these hundreds began to decline, suggesting that the rate of profit was falling below the point at which a northern tier farm would support a family...

The picture was rather otherwise in the large farm belt. Here, farmers used more labor per farm than in any other region. This high use of labor coupled with the region's high absolute use of machinery suggests that the technology of 1850 was inadequate to exploit fully the potential of the land and the scale of farms. To maximize income, therefore, farmers aggregated smaller units of production by hiring more labor

and buying more machinery for these laborers to operate. In effect these farms were composed of several technically efficient units of production...

In these high labor inputs, too, no less than in the intensive technology of the northern-tier farmer, we can read finally the psychological concomittant of capitalist agriculture: namely the drive for income. Farmers in St. George's and other large farm hundreds, used more labor relative to machinery than farmers in the northern tier, not because it made them more efficient, but rather because it allowed them to increase their income. As capital, this income would allow them to expand further in coming years. As money, it allowed them to begin a very different revolution in Delaware rural life--as they became the State's first rural middle class.

Finally, in the data from 1850 we can read...the future of the central region. Farms here were relatively large. The land throughout most of the hundreds was relatively good. In the small commercial wheat production of the region, in the embryonic dairy industry, and in the use of hay for fodder, we see a scaled-down version of large farm agriculture. The principal short-term constraint on the development of that agriculture was the relative inaccessibility of the market. The railroad began to change this in the 1840's. But in 1850, we see still a regionalized pattern of diversified, family farm agriculture, oriented first to subsistence, but secondly, to a growing market. In the coming years, the pace of change would accelerate here. Although the productivity of these hundreds seems never to have equalled that of the large farm belt in the nineteenth century, such preliminary data...suggest that the structural characteristics of the two regions became increasingly similar, and the agriculture of the central hundreds increasingly like that of the large farm belt as the century wore on (Michel 1984: 39-43).

Census records also offer a quantifiable picture of the changes in Delaware agriculture after 1850 (Table 2) (see also Hancock 1947: 383). Interpretive problems exist, however, in the absence of readily available, comprehensive information on rates of inflation and deflation. Cash values can be confidently compared only within individual or a few years, and in some cases changes were dramatic over the course of only a few years. Relative statistics are thus most reliable in outlining changing or stable relationships between values over time. For example, the value of the state's farms increased 247% between 1850 and 1870. This figure, however, assumes the comparison is in 1850 dollars; an 1850 dollar may have been worth more or less in 1870. More revealing are the following statistics: in 1850 New Castle's farms accounted for 2.88 times the value of Kent's; in 1860 this figure dropped to 1.89, and to 1.87 in 1870. Similarly, the value of farm

TABLE 2  
DELAWARE FARMS: PRODUCTION, 1840-1870

	1840****			1850***			1860**			1870*		
	NEW CASTLE	KENT	DEL. TOTAL	NEW CASTLE	KENT	DEL. TOTAL	NEW CASTLE	KENT	DEL. TOTAL	NEW CASTLE	KENT	DEL. TOTAL
VALUE OF FARMS	U	U	U	\$11459451	\$3976908	\$18880031	\$16633176	\$8778258	\$31426357	\$24573079	\$13167760	\$46712870
VALUE OF FARMING IMPLEMENTS AND MACHINERY	U	U	U	\$ 289364	\$ 123037	\$ 510279	\$ 433003	\$ 223222	\$ 817883	U	U	\$ 1201644
VALUE OF SLAUGHTERED ANIMALS, OR SOLD FOR SLAUGHTER	U	U	U	\$ 124965	\$ 100878	\$ 373665	\$ 190096	\$ 173470	\$ 575075	U	U	\$ 997403
VALUE OF HOME MANUFACTURES	U	U	\$ 62116	\$ 50	\$ 8443	\$ 38121	\$ 59	\$ 3021	\$ 17591	U	U	\$ 33070
VALUE OF MARKET GARDEN PRODUCTS	U	U	\$ 4035	\$ 8753	\$ 3961	\$ 12714	\$ 35379	\$ 2066	\$ 37797	U	U	\$ 198075
VALUE OF ORCHARD PRODUCTS	U	U	\$ 28211	\$ 29659	\$ 9897	\$ 46574	\$ 65342	\$ 35694	\$ 114225	U	U	\$ 1226803
VALUE OF DAIRY PRODUCTS	U	U	\$113828	U	U	U	U	U	U	U	U	U
TOTAL VALUE OF ALL FARM PRODUCTS	U	U	U	U	U	U	U	U	U	\$ 4004098	\$ 2322817	\$ 8171667
AGES PAID, INCLUDING BOARD	U	U	U	U	U	U	U	U	U	U	U	\$ 1696571
VALUE OF ALL LIVESTOCK	U	U	U	\$ 884648	\$ 465638	\$ 1849281	\$ 1423443	\$ 911936	\$ 3144706	\$ 2074132	\$ 1184690	\$ 4257323
NUMBER OF HORSES	4745	5869	14421	5764	3914	13852	7057	5208	16562	7464	5232	16770
NUMBER OF MULES AND ASSES	U	U	U	272	368	791	500	1092	2294	883	1436	3584
NUMBER OF MILCH COWS	17477	17450	53883	8759	5014	19248	11228	6178	22595	11733	6222	24082
NUMBER OF OTHER CATTLE (COMBINED WITH MILCH COWS)	U	U	U	9620	6853	24166	9852	8087	25596	0	0	19020
NUMBER OF WORKING OXEN	U	U	U	1850	2941	9797	1717	2620	9530	1364	1274	6888
NUMBER OF SHEEP	13780	7471	39247	5908	7793	27503	4169	5514	18857	5185	5316	22714
NUMBER OF SWINE	27080	14094	74228	10918	16092	56261	10118	15962	47848	9998	11421	39818
VALUE, POULTRY	\$ 16582	\$ 15010	\$ 47265	U	U	U	U	U	U	U	U	U
BUSHEL, WINTER WHEAT	85342	191724	315165	319012	119774	482511	544295	262202	912941	504187	321954	895340
BUSHEL, RYE	U	U	33546	607	5807	8066	2337	18551	27209	1089	6391	10222
BUSHEL, INDIAN CORN	U	U	2099359	1066377	899079	3145542	1141963	1354247	3892337	1002519	885178	3010390
BUSHEL, OATS	294231	564015	927405	483987	105596	604518	676095	317876	1046910	353371	145238	554388
BUSHEL, HAY	U	U	22483	24417	4109	30159	27792	5150	36973	31490	7239	41890
BUSHEL, BARLEY	0	5260	5260	21	15	56	3128	500	3646	U	U	1799
BUSHEL, BUCKWHEAT	U	U	11298	4947	3599	8615	3924	8269	16355	U	U	1349
POUNDS, FLAX	U	U	105000	160	7732	11174	0	5076	8112	U	U	878
POUNDS, TOBACCO	U	U	272	0	0	0	8700	157	9699	U	U	250
BUSHEL, IRISH POTATOS	U	U	200719	121846	67900	240542	175548	107735	377931	193636	81788	362724
BUSHEL, SWEET POTATOS	U	U	U	4108	21325	65443	8417	49803	142213	6501	25418	85309
POUNDS, WOOL	U	U	64404	14372	19582	57768	12594	17532	50201	15195	17555	58316
GALLONS, WINE	U	U	322	50	35	145	530	153	683	120	1238	1552
POUNDS, BUTTER	U	U	U	766803	180016	1055308	981380	271560	1430502	765746	221212	1171963
GALLONS, SORGHUM MOLASSES	U	U	U	U	U	U	717	775	1613	U	U	65908
BUSHEL, PEAS AND BEANS	U	U	U	681	1503	4120	1541	3158	7438	U	U	3123
POUNDS, BEESWAX	U	U	1088	2306	10545	41248	106	365	1993	U	U	800
POUNDS, BEES HONEY	U	U	U	U	U	U	3100	18111	66137	U	U	33151
BUSHEL, CLOVER SEED	U	U	U	2525	0	2525	3194	396	3595	U	U	2228
BUSHEL, FLAX SEED	U	U	U	14	616	904	15	2014	2126	U	U	356
BUSHEL, GRASS SEED	U	U	U	1401	0	1403	714	439	1165	U	U	60
POUNDS, CHEESE	U	U	U	3112	75	3187	6369	2	6579	U	U	315
GALLONS, MILK	U	U	U	U	U	U	U	U	U	U	U	758603

\* Source: U.S. Bureau of the Census 1872: 690, 692-719  
 \*\* Source: U.S. Bureau of the Census 1864: 16-17  
 \*\*\* Source: U.S. Bureau of the Census 1853: 214-215

\*\*\*\* Source: U.S. Bureau of the Census 1853: lxxxiv-lxxxv  
 \*\*\*\* Source: U.S. Bureau of the Census 1853: 143

KEY  
 U=Figure Unavailable

implements and machinery increased 235% over the same period, documenting the adoption of the new labor-saving equipment propounded by agricultural reformers. This figure alone, however, is insufficient to evaluate the actual extent of the mechanization of agriculture during these years. In 1850, New Castle County farmers owned equipment valued over 2.35 times higher than that of Kent farmers; ten years later this index had dropped to 1.99. Between 1850 and 1870, Delaware farmers' livestock also increased in value, by 230%; an even larger increase (267%) occurred in the value of slaughtered livestock. In 1850, New Castle farmers' livestock was valued 20% higher than Kent farmers'; this figure decreased to 10% ten years later.

The state's farmers in 1840 owned, in decreasing numbers, pigs, cows, sheep, and horses, along with smaller numbers of oxen, mules, asses, and poultry. New Castle County farmers owned almost twice as many pigs and sheep as Kent farmers; the number of cows was roughly equal between the two counties. Kent farmers, however, owned about 1,000 more horses than their New Castle counterparts.

By 1850, the ownership of livestock had shifted somewhat. From most to least numerous, Delaware farmers owned pigs (32% more in Kent County), sheep (25% more in Kent County), cattle (29% more in New Castle County), milk cows (43% more in New Castle County), horses (32% more in New Castle County), oxen (37% more in Kent County), and mules and asses. A decade later the livestock distribution had changed again: pigs (37% more in Kent County), cattle (18% more in New Castle County), milk cows (45% more in New Castle County), sheep (25% more in Kent County), horses (26% more in New Castle County), oxen (35% more in Kent County), and mules and asses. Finally, in 1870, livestock ownership, from most to least numerous, exhibited the following pattern in New Castle and Kent counties: pigs (now only 13% more in Kent County), milk cows (47% more in New Castle County), sheep (almost equally distributed between the two counties), cattle (county data unavailable), horses (30% more in New Castle), oxen (now too almost equally distributed between the two counties), and mules and asses.

The numbers of some stock types owned by Delaware farmers also changed substantially over this 30 year period. Mules and asses increased 453% in number between 1850 and 1870. At the same time, farmers maintained smaller herds and flocks of most other livestock reported: a 26% decrease in the number of cattle and a 28% decrease in oxen occurred between 1860 and 1870, while a 42% decrease in sheep (62% decrease in New Castle County) and a 46% decrease in pigs (63% in New Castle County) occurred between 1840 and 1870. Milk cow ownership, and thus the pounds of butter produced by the state's farmers, on the other hand, changed little, dropping only slightly in the decade between 1860 and 1870, yet still remaining over 1,000,000 pounds. In 1850, 73% of the butter was produced by New Castle farmers; in 1860 the figure dropped to 69%, and in 1870 to 65%, still a substantial majority.

Corn, oats, wheat, and Irish potatoes remained the state's dominant field crops across the 1840 to 1870 period. In 1840, Delaware farms produced 226% more bushels of corn than of oats, and 666% more corn than wheat. For the latter 20 years, data are available by county. In 1850, New Castle County farmers produced 220% more bushels of corn than oats and 334% more than of wheat. Ten years later, production of the three principal crops had evened out somewhat, with 168% more bushels of corn produced than oats, and 210% more than of wheat. In 1870, production changed again, with 199% more bushels of corn than wheat, and 283% more corn than oats. In Kent County in 1850, corn production was 751% higher than wheat and 851% higher than oats. By 1860 this imbalance too had decreased. Kent farms that year produced 426% more bushels of corn than oats and 516% more corn than wheat. In 1870, corn continued to dominate in Kent also, but with only 275% more bushels produced than of wheat and 609% more corn than oats.

Only in 1860 did Kent County farmers grow more corn than their counterparts in New Castle County. At the same time, they only outproduced their northern neighbors in wheat in 1840. Between 1840 and 1850, New Castle wheat production increased 73%. Meanwhile, Kent County wheat production decreased, then increased steadily between 1850 and 1870, overall by a figure of 63%. Between 1850 and 1870, New Castle County outproduced Kent in wheat by 266% to only 157% in the latter year. Oats production grew steadily in Delaware's northern county too, until 1860, when production dropped off sharply (by 48% between 1860 and 1870). Only in 1840 did Kent farmers raise more oats than New Castle farmers, by a figure of 191%. Ten years later, New Castle produced 458% more oats. Between 1850 and 1870, the number of bushels of potatoes produced was higher in New Castle as well, by an average 193%.

In 1887, the U. S. Census Bureau published annual data on the acreage, production, and value of corn, wheat, rye, oats, barley, buckwheat, potatoes, hay, and tobacco grown in each state between 1862 and 1886 (see Table 3 for 1862-1879). In Delaware, as expected, corn was most highly valued among the reported crops across the period. Dramatic fluctuations occurred, nevertheless, in the value of the crop, ranging from a low of \$1,568,800 in 1873 to a high of \$6,033,122 in the war year of 1864. Wheat and oats were next highly valued, depending on the year. Wheat ranged in value between \$770,280 in the panic year of 1874 to a high of \$2,668,834 in 1864 during the War. The value of oats produced fluctuated dramatically as well, from \$124,740 in 1878 to \$1,979,030 in 1867. Crop value closely paralleled the acreage devoted to its production. Delaware farmers planted the greatest acreage in corn in most years, between 125,653 acres in 1875 and 267,598 in 1866. The acreage in wheat varied proportionally in a similar manner over time, with a low of 53,454 acres devoted to the crop in 1873-1874 and a high of 87,912 in 1864. Acreage in oats varied more considerably, from 14,423 acres in 1876 to 179,500

**TABLE 3**  
**DELAWARE FARMS: ANNUAL PRODUCTION, CEREALS, POTATOES,**  
**HAY, AND TOBACCO, 1862-1879**  
 (Source: Statistical Analysis 1887)

Products.	Acres.	Production.	Home value.
<b>1862.</b>			
Corn.....bush.	194,617	3,892,337	2,024,015
Wheat.....do.	81,150	1,217,254	1,363,324
Rye.....do.	2,001	34,011	29,407
Oats.....do.	52,342	1,308,837	458,023
Barley.....do.	170	4,254	2,978
Buckwheat.....do.	813	18,399	9,200
Potatoes.....do.	3,374	377,931	188,986
Hay.....tons.	22,888	40,051	44,494
Tobacco.....lbs.	41	12,123	1,455
<b>1863.</b>			
Corn.....bush.	155,693	3,892,337	3,892,337
Wheat.....do.	67,625	1,217,254	1,947,606
Rye.....do.	3,741	37,412	37,412
Oats.....do.	78,518	1,570,364	1,099,255
Barley.....do.	255	5,105	6,126
Buckwheat.....do.	1,840	18,399	18,399
Potatoes.....do.	4,031	302,345	241,876
Hay.....tons.	38,049	38,049	901,225
Tobacco.....lbs.	52	15,618	2,811
<b>1864.</b>			
Corn.....bush.	191,458	3,892,337	6,032,122
Wheat.....do.	87,912	1,054,954	2,668,634
Rye.....do.	2,627	41,153	64,473
Oats.....do.	48,351	1,184,437	947,550
Barley.....do.	170	4,595	4,616
Buckwheat.....do.	782	15,641	15,641
Potatoes.....do.	2,620	327,540	432,353
Hay.....tons.	22,074	33,111	563,339
Tobacco.....lbs.		14,057	
<b>1865.</b>			
Corn.....bush.	235,598	3,892,337	2,919,253
Wheat.....do.	79,330	527,477	1,054,954
Rye.....do.		37,038	37,038
Oats.....do.	157,036	1,864,437	885,685
Barley.....do.	658	4,595	4,385
Buckwheat.....do.	1,490	15,641	15,641
Potatoes.....do.	3,217	380,294	277,426
Hay.....tons.	23,840	29,409	508,000
Tobacco.....lbs.	14	7,029	8,435
<b>1866.</b>			
Corn.....bush.	297,598	4,281,570	3,724,866
Wheat.....do.	83,715	685,720	2,057,160
Rye.....do.	4,408	41,853	55,064
Oats.....do.	154,523	2,317,857	1,274,821
Barley.....do.	748	5,973	5,973
Buckwheat.....do.	828	17,205	22,570
Potatoes.....do.	3,603	270,220	189,154
Hay.....tons.	24,382	26,820	469,350
Tobacco.....lbs.			
<b>1867.</b>			
Corn.....bush.	223,251	3,639,000	3,711,780
Wheat.....do.	73,635	685,000	1,630,300
Rye.....do.	4,571	32,000	48,000
Oats.....do.	163,313	2,711,000	1,979,030
Barley.....do.	210	5,000	6,350
Buckwheat.....do.	1,204	20,000	24,400
Potatoes.....do.	6,153	256,000	256,000
Hay.....tons.	18,750	30,000	529,600
Tobacco.....lbs.	20	10,000	1,000
<b>1868.</b>			
Corn.....bush.	131,000	3,275,000	2,783,750
Wheat.....do.	57,583	691,000	1,312,900
Rye.....do.	4,770	32,000	44,000
Oats.....do.	179,500	1,436,000	861,600
Barley.....do.	208	5,000	6,100
Buckwheat.....do.	1,100	22,000	27,500
Potatoes.....do.	4,600	345,000	315,000
Hay.....tons.	28,400	33,000	680,000
Tobacco.....lbs.	20	12,000	1,183
<b>1869.</b>			
Corn.....bush.	177,777	3,200,000	2,240,000
Wheat.....do.	61,481	830,000	1,082,000
Rye.....do.	5,000	33,000	33,900
Oats.....do.	172,300	1,723,000	775,350
Barley.....do.	250	6,000	5,400
Buckwheat.....do.	923	12,000	13,200
Potatoes.....do.	2,857	200,000	130,000
Hay.....tons.	28,086	30,000	600,000
Tobacco.....lbs.			

Products.	Acres.	Production.	Home value.
<b>1870.</b>			
Corn.....bush.	132,440	3,311,000	2,152,150
Wheat.....do.	62,600	628,000	782,500
Rye.....do.	892	10,000	8,300
Oats.....do.	24,900	498,000	249,000
Barley.....do.	85	1,700	1,564
Buckwheat.....do.	65	1,300	1,300
Potatoes.....do.	2,893	217,000	217,000
Hay.....tons.	37,000	37,000	740,000
Tobacco.....lbs.			
<b>1871.</b>			
Corn.....bush.	162,506	3,575,000	2,145,000
Wheat.....do.	59,828	684,000	1,045,700
Rye.....do.	2,020	10,100	7,575
Oats.....do.	19,500	398,000	163,180
Barley.....do.	100	1,700	1,380
Buckwheat.....do.	88	1,100	847
Potatoes.....do.	1,983	238,000	119,000
Hay.....tons.	28,400	33,000	577,500
Tobacco.....lbs.			
<b>1872.</b>			
Corn.....bush.	164,450	3,289,000	1,808,950
Wheat.....do.	59,782	550,000	880,000
Rye.....do.	1,428	10,700	8,774
Oats.....do.	20,518	318,000	133,560
Barley.....do.	110	1,700	1,445
Buckwheat.....do.	55	1,100	990
Potatoes.....do.	2,375	178,000	178,000
Hay.....tons.	28,250	21,000	430,000
Tobacco.....lbs.			
<b>1873.</b>			
Corn.....bush.	155,789	2,960,000	1,568,800
Wheat.....do.	53,454	588,000	987,840
Rye.....do.	1,000	11,000	9,570
Oats.....do.	20,570	397,000	182,620
Barley.....do.	106	1,800	1,620
Buckwheat.....do.	52	1,200	1,840
Potatoes.....do.	2,288	222,000	173,160
Hay.....tons.	38,271	31,000	606,000
Tobacco.....lbs.			
<b>1874.</b>			
Corn.....bush.	157,833	2,841,000	1,988,700
Wheat.....do.	53,454	588,000	770,280
Rye.....do.	964	10,800	8,100
Oats.....do.	18,905	397,000	206,440
Barley.....do.	101	1,700	1,700
Buckwheat.....do.	53	1,200	960
Potatoes.....do.	2,328	163,000	117,360
Hay.....tons.	31,000	34,100	682,000
Tobacco.....lbs.			
<b>1875.</b>			
Corn.....bush.	125,653	3,267,000	1,462,190
Wheat.....do.	55,185	745,000	1,043,000
Rye.....do.	822	11,100	10,545
Oats.....do.	20,476	430,000	184,600
Barley.....do.			
Buckwheat.....do.			
Potatoes.....do.	3,666	275,000	193,000
Hay.....tons.	30,416	36,500	689,045
Tobacco.....lbs.			
<b>1876.</b>			
Corn.....bush.	128,333	3,850,000	1,925,000
Wheat.....do.	57,500	930,000	1,188,400
Rye.....do.	923	12,000	9,600
Oats.....do.	14,423	375,000	127,600
Barley.....do.			
Buckwheat.....do.			
Potatoes.....do.	4,642	325,000	308,750
Hay.....tons.	31,779	37,500	562,500
Tobacco.....lbs.			

Products.	Acres.	Production.	Home value.
<b>1877.</b>			
Corn.....bush.	179,545	3,950,000	1,975,000
Wheat.....do.	72,592	980,000	1,372,000
Rye.....do.	961	12,500	8,125
Oats.....do.	18,043	415,000	115,250
Barley.....do.			
Buckwheat.....do.			
Potatoes.....do.	4,765	405,000	202,500
Hay.....tons.	36,363	40,000	560,000
<b>1878.</b>			
Corn.....bush.	180,000	4,560,000	1,755,000
Wheat.....do.	80,300	1,043,900	1,043,900
Rye.....do.	1,000	14,500	8,990
Oats.....do.	18,300	462,000	124,740
Barley.....do.			
Buckwheat.....do.			
Potatoes.....do.	4,900	428,300	255,780
Hay.....tons.	36,300	40,658	650,496
Tobacco.....lbs.			
<b>1879.</b>			
Corn.....bush.	180,000	4,860,000	2,673,300
Wheat.....do.	77,800	1,012,700	1,597,254
Rye.....do.	1,000	17,000	11,050
Oats.....do.	18,600	369,600	128,380
Barley.....do.			
Buckwheat.....do.			
Potatoes.....do.	4,400	365,200	219,120
Hay.....tons.	32,037	34,600	501,700
Tobacco.....lbs.			

acres in 1868, when the state's farmers had more land in oats than in corn. Together these figures suggest rates of inflation and deflation must have been comparatively modest across the period.

In addition to these field crops, Delaware farmers raised and sold market garden products in the mid-nineteenth century (Table 2). The data are incomplete, yet a steady increase in the value of these crops is clear. Between 1850 and 1860, for example, the value of market garden products raised in New Castle County increased 17 times. Orchard products grown in the state also increased dramatically over this period, valued at \$28,211 in 1840 and at \$1,226,803 in 1870, an increase of an unbelievable 4,349%. Production levels clearly grew tremendously, even assuming high inflation rates. Between 1860 and 1870 alone, the value of orchard products increased \$1,112,578. These figures reflect Delaware's "peach boom," which several scholars have explored in greater detail.

In the 1930s, Harold Hancock wrote "The Rise of the Delaware Peach Industry 1832-1870." The following excerpts serve to outline the key points of peach growing in Delaware during this period (see also Hancock 1947: 381-383; Scharf 1888: 441-443).

In 1832 the industry had its beginnings [when Isaac Reeves planted one of the earliest budded orchards near Delaware City], and by 1870 it was well-established in the second great period of fruit-growing. The story is not one of uninterrupted success: The prosperous forties gave way before the "yellows" to the terrible fifties, and Delaware did not regain and surpass her former place in the peach-world until the sixties. Locally not only did many people come to depend upon the industry for seasonal employment, but accessories such as nurseries, basket and canning establishments developed. Most vitally, it was connected with the transportation problem, and within those years Delaware saw most of the transformation from water to rail take place...

The greatest of...[the] early peach growers was Major Philip Reybold. Planting his first orchard in 1835 and adding to it in 1838 and later years, by 1842 he owned 120 acres containing 12,960 trees... In 1843 the Reybold family owned 78,000 trees... The acreage of peaches in New Castle county in 1846 was estimated to be 2500 to 3000 acres, and...the vicinity near Delaware City must have contained half of this total... No other section of Delaware, and doubtless no other part of the United States, rivaled the Delaware City area in the raising of peaches before 1855.

...In 1855 the district along the Appoquinimink Creek produced 100,000 baskets of peaches. Slightly to the west of this area, at Middletown in 1853...[p]eaches...[were] very abundant... The importance of the remainder of...[New Castle]

county to the production was recognized in 1847, when it was credited with one-third of the state's crop of 100,000 baskets... The development of the peach industry in New Castle county, outside of the area near Delaware City, was slow, mainly because of the lack or distance of transportation facilities... Peach growing in Kent county before 1855 was somewhat more backward... The lack of transportation facilities in both Kent and Sussex counties prior to 1855 hindered any extensive development of fruit growing...

The year 1856 in several ways marks the end of the first period of peach planting and the beginning of a new era. By December, 1856, the railroad had been extended to Dover and Seaford, opening up this vast hinterland for the industry. A perfect mania of planting in the interior of the state followed. No longer need the industry be confined to the proximity of the bay or the shores of navigable streams...

[The "yellows" first appeared] around Delaware City...[in] 1842, where it spread like wild fire on the Reeves and Ridgeway farm. Undoubtedly it accounted for the migration of the early peach growers about this time from Delaware City to new plantations in Kent and Cecil counties, Maryland...

While this productive peach region remained barren even in 1870, the interior of Delaware entered upon an era of planting with results soon evident in the size of their railroad shipments. Especially large was the acreage set out in New Castle county. In 1856 two orchards of ten and fifteen thousand trees were planted near Middletown, and about 1860 even greater developments occurred...

...The new centers of the industry [became] districts near Dover, Middletown, and along the Appoquinimink Creek. A rough index of the sharing of the counties in the production is furnished by the census figures for 1860. The orchard products of New Castle county were worth twice those of Kent...

Because of the extent of the peach industry after 1865, which made central Delaware almost a "continuous orchard," the great crops of 1867 and 1869, and the many sources of information which enable a fairly complete picture of the trade to be formed, the five-year period from 1866 to 1870 has been dealt with as a separate and final unit in our history. Frosts greatly reduced the size of the crop in 1866.... But the year 1867 will not soon be forgotten in the annals of peach history... Frosts in 1868 again ruined the peach crop... The greatest year of peach production within this period to 1870 occurred in 1869... The effect of the extension of the railroad into the hinterland was for the first time fully felt...



In 1870...[New Castle County] was credited with 1,000,000 bearing trees, while in 1871 Kent was believed to contain only 800,000 trees altogether. The census returns for 1870 based on the crop for 1869 show that the orchard products of Kent were valued at only five-sixths those of New Castle...

Prices for peaches from 1856 to 1870 were more than satisfactory. At the beginning of the period the production of Delaware City was declining, and prices were high. Even in Delaware in 1858 peaches sold for \$1 per basket. In 1863 prices averaged from 80 cents to 90 cents; in 1867 they ranged from \$1 to \$1.50... "Gluts" were normally prevented by improved shipping facilities, and of the four-fifths of the crop sent to New York, a great part was reshipped northward. Philadelphia...was supplied locally or by Maryland peaches shipped through the Delaware and Chesapeake Canal. Less than 100,000 baskets or one-twentieth of the total sent over the Delaware Railroad in 1869 was disposed of in Philadelphia...

Anne Mayer's study of agriculture in four New Castle County hundreds between 1850 and 1880--Brandywine, Christiana, St. Georges, and Appoquinimink--based on analyzing the manuscript schedules of the Censuses of Agriculture and Population (Mayer 1975: 2-4), allows us to look more closely at Michel's northern tier farms and those of the large farm belt in the decades after mid-century.

The southern hundreds' farms averaged much larger sizes than their northern counterparts throughout the period. St. Georges farms consistently had the largest mean acreage, 210 acres in 1850 and 188 in 1880. Brandywine Hundred farms, at the other end of the spectrum, averaged 76 to 78 acres between 1850 and 1880. Throughout the period, all hundreds reported in excess of 70% of the farmland improved. Again, St. Georges Hundred consistently reported the highest percentage, from 88% to 91% between 1850 and 1880. Finally, St. Georges farms were also most highly valued, although per acre values in Brandywine and Christiana hundreds appear greater. Capital investment in farm implements and machinery increased steadily, peaking in 1870. In the following decade, the depression limited the region's farmers' ability to add to their corpus of agricultural technology. As in all other measures, St. Georges farmers owned farm machinery of the greatest value, ranging from \$229 in 1850 to \$648 in 1870. By contrast, Appoquinimink farmers invested only between \$132 (1850) and \$211 (1880) in farm equipment (Mayer 1975: 57-71).

In every hundred, livestock was worth two to three times the value of the farms' machinery. As Michel predicted, in each of the four study hundreds, the draft animal of choice became the horse. The number of farms reporting horses declined after an 1860 peak, reflecting the growing number of very small farms (under 20 acres) recorded in all the hundreds. These market garden farms or small

orchards had little need for draft animals. Furthermore, the southern hundreds' farmers did begin to select the less expensive mule for farm work when feasible. Oxen, however, disappeared from the hundreds' farms as mechanical devices, which they were ill-equipped to handle, gained popularity (Mayer 1975: 73-84). The Civil War may have contributed to the transition to mechanical and mule power as well, as horses were pressed into military service.

As Jensen and Michel found in the first half of the nineteenth century, the county's northern hundreds continued to house the state's largest dairy herds. Through 1860, the principal marketable product of these herds remained butter, not fresh milk, still not transportable to market in quantity without spoiling. By 1880, St. Georges Hundred farmers sold nearly 50,000 gallons of milk. Raising beef cattle engaged between 60% and 80% of the hundreds' farmers across the time period, with the rolling plain of St. Georges especially well-suited to this undertaking. "There, the herds were larger and a higher percentage of the farm population listed beef cattle in their census returns" (Mayer 1975: 93). Pigs were ubiquitous on these New Castle farms in the second half of the nineteenth century as well; however only in Appoquinimink Hundred did more than 20% of the farmers own sheep (Mayer 1975: 84-99).

Not surprisingly, St. Georges Hundred consistently recorded the highest percentages of farms producing wheat, and these farms produced an average of 762 bushels by 1860. Appoquinimink Hundred farmers grew the least wheat across the period. In each hundred, well over 90% of the farms grew corn, although production was much greater in the southern hundreds, as it was also for oats. In St. Georges, for example, farms produced an average 1,030 bushels of corn in 1879. The northern hundreds, in comparison, far surpassed the southern two in the production of hay, as dairy herds needed summer pasture and winter feed. In addition, these northern farmers probably shipped portions of their hay crop to Wilmington and Philadelphia. The only other crop produced by more than 85% of the hundreds' farms between 1850 and 1880 was the Irish potato, grown for both human and livestock consumption. Production in the northern two hundreds was generally double that of the southern hundreds. In Christiana Hundred, for example, production averaged between 100 bushels in 1850 and 133 bushels in 1860. This compares with averages of 40 to 55 bushels in Appoquinimink (Mayer 1975: 104-120).

The course of the peach industry in New Castle and Kent counties has already been traced. Mayer's study found that in the northern study hundreds, orchards were devoted almost exclusively to apples rather than peaches. For Appoquinimink Hundred, as well, apples formed an important commercial crop by 1880 (Mayer 1975: 121-125).

In concluding, Mayer concurs with Michel that

agriculture in the middle years of the nineteenth century was characterized by a growing awareness of the market place and an increased interest in monetary return. Market considerations also accounted for differences between the hundreds under consideration... [T]he availability of the Wilmington market led to a greater specialization by the northern two hundreds in dairy products, hay, market gardens, and egg production. As transportation facilities improved, the southern hundreds took advantage of the newly opened markets by dramatically increasing their production of wheat. The new accessibility of markets created by the extension of the railroad made possible the commercial development of orchard products, especially peaches, the only crop for which Appoquinimink Hundred assumed the lead over the other three hundreds (Mayer 1975: 129).

Research in tax assessment records and other document collections by the University of Delaware Center for Historic Architecture and Engineering has contributed further to our understanding of the agricultural system in Delaware's Upper Peninsula in the nineteenth century. Specifically, these researchers focused on the phenomenon of farm tenancy as they constructed an Historic Context for agricultural tenancy in the Upper Peninsula, 1770-1900 (Siders et al. 1991). Their analyses of tax assessments in particular from nineteenth-century Appoquinimink, Little Creek, and Murderkill hundreds has been extended in this study through the addition to the data base of the 1837 and 1861 tax assessments from the Piedmont hundred of Mill Creek.

In 1837 and 1861, Mill Creek farms contained considerably less land than those of the three Upper Peninsula study hundreds. Average farm size in Mill Creek declined from 89 to 82 acres over the period, and almost two-thirds of the farms in both years contained fewer than 100 acres (Table 4). In Little Creek, in contrast, average farm size declined from 161 to 133 acres between 1822 and 1860; in Murderkill the figures are similar, 168 acres in 1822 and 129 in 1860. Appoquinimink, the northernmost Upper Peninsula hundred studied, contained the largest farms, averaging 175 acres in size in 1816 and 147 acres in 1861 (Siders et al. 1991: 26-34).

Between 1837 and 1861, one-half of Mill Creek Hundred's taxables owned livestock (Table 4). The recording of only the total value of livestock owned by each taxable in both years hinders analysis. In Kent County hundreds and in some New Castle hundreds in some years, in contrast, assessors recorded the number of different kinds of animals taxables owned (see Siders et al. 1991 for example). While livestock ownership declined over the nineteenth century in the three Upper Peninsula hundreds studied

TABLE 4

TOTAL ASSESSMENT, MILL CREEK HUNDRED, 1837 AND 1861  
AGRICULTURAL PRODUCTION

	MILL CREEK HUNDRED			
	1837		1861	
	<u>\$</u>	<u>%</u>	<u>\$</u>	<u>%</u>
FARMS	299		321	
FARM ACREAGE	26743.5		26264	
AVERAGE FARM ACREAGE	89.44		81.82	
FARM SIZES IN ACRE	11-374		10-287	
FARMS SMALLER THAN				
100 ACRES	182	61	200	62
HOUSES ON FARMS	280	83 <sup>1</sup>	315	89 <sup>1</sup>
- BRICK	22	8 <sup>2</sup>	29	9 <sup>2</sup>
- STONE	137	49 <sup>2</sup>	187	59 <sup>2</sup>
- FRAME	28	10 <sup>2</sup>	65	21 <sup>2</sup>
- LOG	92	33 <sup>2</sup>	32	10 <sup>2</sup>
- UNSPECIFIED	1	---	2	1 <sup>2</sup>
BARNs ON FARMS	209	99 <sup>3</sup>	260	96.7 <sup>3</sup>
- BRICK	3	1 <sup>4</sup>	2	0.5 <sup>4</sup>
- STONE	89	43 <sup>4</sup>	93	36 <sup>4</sup>
- FRAME	86	41 <sup>4</sup>	160	62 <sup>4</sup>
- LOG	30	15 <sup>4</sup>	3	1 <sup>4</sup>
- UNSPECIFIED	1	---	2	0.5 <sup>4</sup>
OUTBUILDINGS ON FARMS				
- STABLES	26		15	
- BARRACKS	1		---	
MULTIPLE PROPERTY OWNERS	46		37	
HOUSES	89	26.5 <sup>1</sup>	76	21.61 <sup>1</sup>
- BRICK	15	17 <sup>5</sup> /68 <sup>6</sup>	8	11 <sup>5</sup> /27 <sup>6</sup>
- STONE	27	30 <sup>5</sup> /19.7 <sup>6</sup>	39	51 <sup>5</sup> /20 <sup>6</sup>
- FRAME	15	17 <sup>5</sup> /53.6 <sup>6</sup>	23	30 <sup>5</sup> /35 <sup>6</sup>
- LOG	31	35 <sup>5</sup> /33.7 <sup>6</sup>	6	8 <sup>5</sup> /18 <sup>6</sup>
- UNSPECIFIED	1	1 <sup>5</sup> /---	---	---
BARNs	55	28.6 <sup>3</sup>	52	19.3 <sup>3</sup>
- BRICK	1	2 <sup>5</sup> /33.3 <sup>6</sup>	0	0/0
- STONE	28	51 <sup>5</sup> /57.3 <sup>6</sup>	19	37 <sup>5</sup> /40 <sup>6</sup>
- FRAME	17	31 <sup>5</sup> /19.7 <sup>6</sup>	33	63 <sup>5</sup> /40 <sup>6</sup>
- LOG	9	16 <sup>5</sup> /30 <sup>6</sup>	0	0/0
STABLES	9	25.7 <sup>7</sup>	4	26.7 <sup>7</sup>

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1 % OF ALL HOUSES

2 % OF HOUSES ON FARMS

3 % OF ALL BARNs

4 % OF BARNs ON FARMS

5 % OF MULTIPLE PROPERTY OWNERS' HOUSES/BARNs

6 % OF ALL HOUSES/BARNs OF THIS MATERIAL

7 % OF ALL STABLES

TABLE 4 (cont.)

TOTAL ASSESSMENT, MILL CREEK HUNDRED, 1837 AND 1861  
AGRICULTURAL PRODUCTION

	MILL CREEK HUNDRED			
	<u>1837</u>		<u>1861</u>	
	<u>#</u>	<u>%</u>	<u>#</u>	<u>%</u>
LIVESTOCK OWNERS	375	49 <sup>1</sup>	452	51 <sup>1</sup>
AVERAGE VALUE OF				
LIVESTOCK OWNED	<u>\$</u>	<u>#</u>	<u>\$</u>	<u>#</u>
- LIVESTOCK				
OWNERS	\$177.99	375	\$270.01	452
- TAXABLES	\$ 88.06	758	\$138.06	884
- LANDOWNERS	\$157.49	293	\$355.82	541
- NON LANDOWNERS	\$ 44.31	465	\$225.59	343
- FARM OWNERS	\$178.87	257	\$251.41	289
- LAND AND				
LIVESTOCK OWNERS	\$222.17	216	\$336.81	252
- FARM AND				
LIVESTOCK OWNERS	\$243.23	184	\$373.70	220
- NON LANDOWNER				
AND LIVESTOCK OWNERS	\$ 99.09	160	\$181.64	199

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1 % OF ALL TAXABLES

by the University of Delaware Center for Historic Architecture and Engineering (Siders et al. 1991: 53), livestock ownership may have increased between 1837 and 1861 in Mill Creek. The average value of the livestock owned by taxables who owned any livestock increased almost \$100 over the quarter century. Farm owners owned livestock valued higher than the stock of non-farm owners across the study period. In 1837, they owned livestock valued an average of \$146.14 more than non-landowning livestock owners, those taxables defined as "tenant farmers" for the purposes of this study. By 1861, the difference had increased to \$192.06. Using this definition of "tenant farmer," Mill Creek housed 160 farm tenants in 1837, and 199 in 1861. Counting the number of farmers who owned farms with houses on them but owned no livestock provides another estimate of the number of farms operated by tenants. In 1837, such farms numbered 89; in 1861, 82. Finally, the tenant farmers who owned substantial numbers of livestock (as estimated by value) are also identifiable in the tax assessments. In 1837, only one owned livestock valued over \$600, three owned stock valued over \$500, one over \$400, 10 over \$300, and 15 over \$200 (a total of 19% of the "tenant farmers"). In 1861, the number of "tenant farmers" owning livestock assessed at over \$300 breaks down as outlined below. Again, these taxables account for about 20% of the "tenant farmers."

\$900-\$1000	1
\$700-\$800	6
\$600-\$700	4
\$500-\$600	11
\$400-\$500	10
\$300-\$400	8

Bernard Herman's exploration of the agricultural landscape of southern New Castle County (Blackbird, Appoquinimink, St. Georges, Red Lion, and portions of Pencader and New Castle hundreds) (Herman 1987: 3-4) has demonstrated our need to understand the material culture of the farm in our quest to comprehend nineteenth-century Delaware agriculture and farm life. He discovered a rebuilding of the agricultural landscape in the nineteenth century, which he sought both to document and to explain. The rebuilding began in the 1820s with the enlargement of existing houses, principally along the eastern coast of the Upper Peninsula. By the middle of the next decade, building projects were more frequently new construction, especially in the area of large wheat farms around Middletown. Farm buildings too were rebuilt and replaced. "Beginning in the 1830s crib barns and bank barns were introduced as utilitarian and technologically stylish buildings, along with new designs for stables, cart sheds, and granaries" (Herman 1987: 146).

The increased economic capital of southern New Castle County's urban-oriented market agricultural community bankrolled the rebuilding. Why the county's successful farmers chose to rebuild

"when and as" they did proved the most difficult question. Herman finally concluded

The values the new houses and barns expressed are paradoxical. Dwellings became larger, incorporating more and more specific functions within their walls; but in spite of the increase in space, social and domestic movement became progressively more congested as room use was more narrowly defined. Agricultural buildings were designed and built to streamline and industrialize the production of the farm, but those who commissioned their construction underutilized the new forms, retaining an allegiance instead to the old way of doing things. The drive was to build anew and to architecturally restructure the relationships between man and the land and between the members of the society. The language used by the movement's proponents to describe the process was reform minded, innovative, and progressive. However, the reality they built on the land was the entrenchment and celebration of the way things had already come to be (Herman 1987: 147) (see also 2. Sociocultural Context).

A striking feature of the rebuilding was that it occurred "in an area where a substantial, durable dwelling stock already existed... [T]he [old] houses...were abandoned, demolished..., or temporarily converted to other uses, only to be vacated... Some of the earlier buildings were undoubtedly recycled as tenant houses, but by the 1840s even that housing was being rapidly improved through a process of total replacement" (Herman 1987: 160). Farm owners provided new tenant houses for their farm managers and for their resident laborers. Both often could be found on a single farm, occasionally not far from the main house (Herman 1987: 160-163).

The new farm buildings of nineteenth-century southern New Castle County "became the primary vehicles that individual farmers used to communicate the new values of the agricultural reform movement" (Herman 1987: 199). Of all these new building types, the "timber-frame crib barn, or granary, was the most common." Here farmers stored their feed corn in cribs and lofts and grain for the family in bins (Herman 1987: 200-202). Less common but more capital-consuming and impressive are the bank barns, "the architectural incorporation of the nineteenth-century agrarian goal." Through this monumental architecture, farmers who were able demonstrated their character and the success of their agricultural economy (Herman 1987: 206-208). Those who did not choose a bank barn built instead tripartite horse barns that housed both livestock and hay. Like the bank barns, they were often both quite impressive and underutilized. Other outbuildings erected include separate carriage barns, hay barracks, and wagon sheds. In the less prosperous southwestern area of the county, farmers constructed smaller versions of these buildings arrayed in courts and ranges (Herman 1987: 217, 220, 222).

The analysis of Mill Creek Hundred tax assessment records for 1837 and 1861 allows us to extend Herman's data base up into Delaware's Piedmont. The availability of stone in the Piedmont meant that farmhouse construction differed between the Piedmont and Upper Peninsula in the early and mid-nineteenth century. Half of Mill Creek's farmhouses in 1837 were built of stone; the number reached almost 60% by 1861. In Little Creek in 1822, in contrast, 82% of the houses were log or frame; the remaining were built of brick. Little Creek contained no stone houses (Siders et al. 1991: 35). Between 1837 and 1861, Mill Creek's cultural landscape changed rather dramatically, however, despite the fact that average farm size changed little. The hundred lost 60 log farm dwellings in just under one-quarter of a century, while the number of frame houses doubled, and Mill Creek farmers constructed 50 new stone houses.

Stone houses, however, did not just mark the Piedmont's elite farmers as brick houses did further south. In 1837 54% and in 1861 61% of the hundred's stone houses were owned by farmers in the 6th through 8th deciles of total assessment (with the 1st decile the uppermost). Nevertheless, 55% of the wealthiest farmers (uppermost total wealth decile) in 1837 and 80% in 1861 owned stone houses. Stone houses also became increasingly common among the hundred's multiple property owners. While 30% of them owned stone houses in 1837, more than half did in 1861. In 1837, approximately another one-fourth of the farmers in the upper three total wealth deciles lived in brick houses; multiple property owners owned more than two-thirds of them. By 1861, only 11-13% of the farmers in these deciles owned brick houses; in fact, brick houses were distributed fairly evenly among farmowners in all wealth deciles. Multiple property owners, though, still owned more than one-quarter of all the hundred's brick houses.

Over 40% of the frame houses in Mill Creek in 1837 stood on farms owned by farmers in the second to lowest wealth decile. Multiple property owners owned more than half the frame houses, along with one-third of the log houses, indicating their predominance on tenant farms. Seventy-five percent of the log houses stood on farms owned by farmers in the 7th through 9th deciles. These are the farmowners who replaced their houses over the next few decades. More than half of the remaining log houses in 1861 stood on farms owned by farmers in the 9th decile, while farmers in the 8th and 9th deciles owned 45% of the frame houses. Nevertheless, in 1861 over one-third of the farm owners in the 2nd decile also owned frame houses (compared to 8% in 1837). Multiple property owners at all wealth levels owned one-third of the frame houses, again pointing to wood as the material of choice for tenant houses.

By 1837, most of Mill Creek's barns were also constructed of stone (Table 4), though an almost equal number were frame. More



than half of the stone barns that year stood on farms owned by multiple property owners. By 1861, the hundred's farmers had built at least 78 new barns, and lost at least 28. Although they built their new houses of stone, they constructed their new barns overwhelmingly of wood, so that in 1861 almost two-thirds of the barns on Mill Creek farms were of frame construction. Multiple property owners still owned 40% of the hundred's stone barns that year, a function in part of their relative permanence. Barns in Mill Creek were not distributed evenly across the farm landscape in either 1837 or 1861. None of the taxables in the lowest total wealth decile owned a barn in the earlier year, and only two owned frame barns 24 years later. Ten percent of the taxables in the next lowest decile owned twelve frame barns, two of log, one of stone, and one of unspecified material in 1837. In contrast, an average of 70% of the taxables in the upper two wealth deciles owned barns that year. Analysis of barn ownership by wealth decile also demonstrates that farmers in the lower (but not lowest) wealth deciles were the ones building most of the barns between 1837 and 1861. By the latter year, for example, over 40% of the taxables in the second lowest decile owned 38 frame barns, 8 stone barns, and a log barn. Finally, unlike in Little Creek, where 37% of the farms had stables in 1822 and 47% did in 1860 (Siders et al. 1991: 35), the tax assessments indicate that only 9% of Mill Creek farms in 1837 and 5% in 1861 contained stables. In Mill Creek, stabling was most often provided by the bank barn, so well-suited to the Piedmont topography.

Newspaper advertisements for farms for sale offer another insight into the agricultural landscape. Although not necessarily a representative sample of the counties' farms, they do emphasize what the farmers themselves considered the important components of their farms. Consider the following sample from the Delaware Gazette and American Watchman in 1829 (Bengston 1992).

Within one mile Cantwell's bridge..., log dwelling house, well near door, large frame barn, some marsh and some woods, mostly meadow

Cedar fence/hedge separates 7 fields... On road from Wilmington-New Castle log house, kitchen, well in yard, nearly new 55x33 frame barn

134 acres enclosed by hedge, divided into 8 fields by post-and-rail fence, brick house with 3 rooms, entry and kitchen on lower floor, 6 rooms up, pump, stone stable, brick storehouse, 2 granaries, etc.

Large two-story brick dwelling house, frame stable, cribs, landing on creek, 400 acres upland, 30 of woodland, 100 of marsh, 300 of improved marsh

Log dwelling house, three rooms to a floor, barn, stables, a well at door, apple orchard, on road from Christiana to Elkton

2 story brick dwelling house, kitchen, granary, carriage house, corn cribs, stables, still, cider house, 250 acres timber...

Stone house, pump, stone barn, gig-house, corn crib, hog house, brick smoke house (Gap and Newport Turnpike)

Fourth part of a plantation, log house and barn, smoke house and granaries

Frame dwelling house, corn cribs, other buildings

2 story brick dwelling and kitchen, frame barn and other buildings, and an apple orchard

Plantation, log house, smoke house, kitchen, etc.

Two logs houses, other out buildings

Dwelling house, part thereof new, log barn, new frame granary, apple orchard (Road from Newark to Christiana Bridge, at fork of road to Stanton)

Frame dwelling house, kitchen, corn cribs, carriage house

2-story brick dwelling house, brick kitchen, frame barn, stables, corn cribs, milch house, granary, apple orchard

Frame dwelling house, log kitchen, stable, granary, corn crib (Along Blackbird Creek)

2-story stone dwelling house, stone barn, milch house, other buildings

Pump at door under roof, large cellar, 60x40 foot barn with good stabling underneath, carriage house, smoke house, corn house and other outbuildings. Hedges and fences. 7 fields, 40 acres wood.

Stone house, pump at kitchen door, 45x35 foot stone barn, with a shed for cart or chair, spring house, apple orchard (3 miles southwest of Kennett Pike)

A Valuable Farm and Mansion, dwelling house, barn, carriage house, milk house, shrubbery, vegetable garden, cedar fence (On the Philadelphia Turnpike, within one mile of Wilmington)

Frame house and barn

Brick house, 65x55 brick barn, stable (stalls for 60 head cattle) 17x17 poultry house, 28x19 carriage house, granary, 60x10 sheep house, stone smoke/spring house, ice house (Within 2 miles of New Castle)

Log house, kitchen, smoke house

Fields separated by good fences and thorn hedge, 2-story stone house and kitchen, well near door, stone spring house with smoke house above, 45x35 barn, 2 sheds, apple orchard, pump in barnyard (Between Wilmington and Kennett Square)

2 story brick house and kitchen, frame barn, cellared under, log dwelling house

Half part of a plantation, two log houses, other buildings

Dwelling house, part log and part frame, log stable, corn crib, and carriage house (Bordered by road from Red Lion to St. Georges)

These ads too document a landscape in transition. That the location of most of the farms does not appear in the ads masks the regional variation that characterized the landscape. Nevertheless, a sense of the agricultural world in the process of rebuilding comes through. Still present in numbers are the log farmhouses with one or a few multipurpose outbuildings. They coexist on the land, however, with dwelling houses "part thereof new", and with brick and stone farmhouses surrounded by new barns, stables, and various other support structures built by the region's farmers to serve specific functions. Although advertisements placed in the Delaware Republican and Delaware State Journal in the 1850s more frequently comment only on the general condition of a farm's buildings, some describe their number and type (Jenkins 1992). They provide a comparative sample from a time when the rebuilding in southern New Castle County had been well underway for three decades.

#### New Castle County

On White Clay Creek in Mill Creek Hundred: 150 acres, 20 in timber, an apple orchard and fruit trees. 2 story stone dwelling and barn, tenant house, frame barn and outbuildings

On Wilmington and Philadelphia Turnpike, Brandywine Hundred: 83.5 acres with fruit trees, a stone dwelling, kitchen, stone stable, and frame barn

On Wilmington and Philadelphia Turnpike, Brandywine Hundred: 163 acres, good dwelling, new barn, potato or root house, 3 tenant houses, stables, 8 foot stone wall

On Philadelphia, Delaware, and Baltimore Railroad, Brandywine Hundred: 40 acres with orchards, small stone house, barn, workshop, carriage house

.5 mile from Wilmington on Newport Pike: 40 acres, cottage house, tenant house, carriage house, out buildings, barn, granary

At Newark Depot, White Clay Creek Hundred: 40 acres wooded, with fruit trees, brick mansion, brick and stone dwelling, barn, ice house, smoke house, carriage house, milk house, granary, corn crib, out buildings, 4 good tenant houses

.25 mile from Newark Depot, White Clay Creek Hundred: 123 acres, 23 wooded, frame house with kitchen, barn, stables, granary, outbuildings

1 mile from Newark on Christiana Creek, White Clay Creek Hundred: 98 acres, orchard, frame house with kitchen, barn, granary, 2 tenant houses

New Castle Hundred: 327 acres, 120 in marsh, frame dwelling, granary, corn cribs, barn, 3 houses for laborers

.5 mile south of Glasgow, Pencader Hundred: 224 acres, 25 in timber, orchards, brick house with frame kitchen, stables, granary, corn cribs, carriage house, out buildings

1 mile from Smyrna, Appoquinimink Hundred: 100 acres, 15 wooded, with an orchard. Frame dwelling, granary, stable

By 1860, although many northern and central New Castle farms appear smaller from this small sample, their owners both used them more intensively and had invested considerably in capital improvements. These improvements included not only orchards that produced a direct economic return, but a multitude of special purpose farm outbuildings and houses for the tenants who worked the land in increasing numbers.

Historical biographies of individual farms are another essential component of an Historic Context for the archaeology of New Castle and Kent county agriculture and farm life between 1830 and 1940. They offer a view over time of individuals' decisions and strategies as they responded to and in turn affected larger economic, social, material, and ideological trends and processes. Archaeological studies of New Castle and Kent county farms have provided a small sample of such historical biographies. The results of the archaeological investigations and the contributions of this research to the context being constructed here are presented below in a separate section. The following discussion focuses on agricultural strategies, the agricultural landscape, and where possible, on the continuities and changes in agricultural production at these farms as the nineteenth century progressed.

The Robert Ferguson/Weber farm on East Chestnut Hill Road (Route 4), in Ogletown, White Clay Creek Hundred, New Castle County passed through four families between 1830 and 1880. In 1828 the

145 acre farm, which straddled the road, contained a log house and frame barn, and was valued at \$2,900. In 1833 the farm's owner, John Reed, died. An inventory of his possessions sold at a public sale provide a glimpse of his agricultural strategy and practices and the material culture he employed in implementing them. At the time of his death, Reed had 50 bushels of corn, 105.5 bushels of oats, and 175.5 bushels of corn in stock. In addition, he had a "lot of wheat" in the ground, and kept one pig, a horse, three cows and a calf, and 13 sheep for food and wool. Except for the small herd of sheep and perhaps a wheat surplus, Reed seems principally to have been farming to meet his family's needs. To carry on his farming activities, Reed owned only an assortment of carpenter's and other hand tools, storage tubs, buckets, and barrels (Coleman et al. 1983: 13, Appendix 7).

The year after Reed's death, the farm was sold to Robert Ferguson. Over the next three years Ferguson added a new frame house and a new barn to the farm. By the time of the 1850 census, Ferguson counted himself among the hundred's "gentlemen." His farm was worth \$10,000, and he owned a slave and a bonded servant. He lived, however, in the old log house, while his son and namesake lived across the street in the newer house. From there he managed the farm. In the 1850s Ferguson owned livestock valued between \$389 and \$550. In contrast, Reed's livestock had sold for just under \$70 in 1833 (Coleman et al. 1983: 13-14, 17). The 1850 Census of Agriculture placed the market value of the farm at \$8,000. The Fergusons' four milk cows produced sufficient milk for 250 pounds of butter for the market, while their six other cattle and three pigs provided food for the family and a small surplus for market. As at other local farms at mid-century, the Fergusons focused on raising Indian corn (1300 bushels), wheat (700 bushels), oats (600 bushels), and garden crops that sold that year for \$100 (Coleman et al. 1984: 238).

By the time of the next census, the Currinder family owned the farm. They shifted their agricultural strategy slightly, purchasing three more milk cows. Together their seven cows allowed the family to produce 952 pounds of butter that year, almost four times that produced a decade earlier by the Fergusons. In addition, while they raised no garden produce for market, a newly planted orchard brought an income of \$100. At the same time, they invested less land and effort in raising corn; their crop was down 40% from that harvested by the Fergusons in 1850. The Morrison family, who owned the farm at the time of the 1880 census, further intensified dairying on the farm. They owned livestock valued at \$6,345, six times the value of the Currinders' livestock in 1870, and produced an impressive 1800 pounds of butter with milk from their ten cows. They returned to market gardening as well, but their ten apple trees brought in only \$5 that year. While continuing to raise wheat and corn as the Currinders had, they dramatically decreased their production of oats, further specializing their cropping over that of the Ferguson and Currinder

families (Coleman et al. 1984: 238). The Ferguson-Currinder-Morrison (Ferguson/Weber) farm dramatically illustrates the transformation of agriculture in northern Delaware during the 1830-1880 period. It also highlights the way in which the transformation resulted from the collective decisions of individual families, each with their own goals and strategies to achieve them as they negotiated within the economic, material, and social world in which they lived.

By 1814, Thomas Forman of Cecil County, Maryland, owned nine tenant farms in Delaware. One of these he purchased that year, a 200 acre farm near the Ferguson farm along present-day Route 4 in Ogletown, White Clay Creek Hundred. Forman's tenant farm, which remained in his estate until 1851, contained only a two-story log house and barn throughout his tenure, according to the tax assessments. The farm appreciated steadily in value, however, and the archaeologists discovered evidence of several early to mid-nineteenth century outbuildings. In 1828 tax assessors appraised the farm at \$2400; in 1851 Forman's widow sold the farm for \$4000. The Oldham brothers purchased it; they too rented it to tenants until Forman's niece sued them for an unpaid debt. In 1878 she bought the farm back at a sheriff's sale (Hoseth et al. 1990: 77-80).

Also in 1814, Abraham Warrick of Wilmington purchased a 260 acre farm along the Christina River just west of Christiana for \$9200. The farm contained a post-in-ground house, stable, and barn constructed early in the previous century, as well as an almost new brick house. Warrick sold the farm, which he had rented to tenants, to Edward Hamman for only \$5000 in 1834. Hamman and his family farmed the property until his death in 1846. They lived in the brick house and continued to rent the eighteenth-century post-in-ground complex to tenants who assisted with the farming. Hamman also owned a slave in 1837, although by 1840 he worked the farm only with the assistance of his wife, elder children, and the tenant family. By the time Hamman's mortgage had been paid off five years after his death, the tenancy was reported in poor condition. It had recently been rented for \$25 per year, and contained 2.5 acres of fenced cleared land, probably a garden, 7.5 acres of meadow, and two young apple and peach orchards. The old house was apparently not repaired, and probably not inhabited after the early 1850s (Shaffer et al. 1988: 51-53).

Tax assessments document the steady increase in the farm's value through at least 1861, when Thomas Whitten owned it. Described in the assessments as housing a two story brick dwelling (the 1807 house which still stands) and a frame barn, the farm increased from \$6500 to \$10,000 in value between 1837 and 1861. The value of the farmers' livestock also increased, more than doubling from the \$316 assessed Hamman in 1837 to \$740 in 1861.

The 1850 Census of Agriculture reported that Hamman's farm contained 150 acres of improved land and 110 unimproved acres (Shaffer et al. 1988: 53, 56).

The cash value of the Hamman farm was reported to be \$12,000. This amount is almost four times the median value of \$3,050 for farms in White Clay Creek Hundred reported in the 1850 Agricultural Census (Michael [sic] 1985: Table 1). In addition, the Hamman farm owned machinery and implements valued at \$150--almost 1 and 1/2 times greater than the \$107 median value of machinery for other White Clay Creek Hundred farms in 1850 (Michael [sic] 1985: Table 10). This greater mechanization resulted in dramatically greater production--Hamman produced more than four times the median amount of wheat and twice the oats and hay as other farms in the Hundred in 1850 (Table 10) (Shaffer et al. 1988: 58).

In 1829, William Hawthorn received his family's farm, seven years after his mother's death, and only after all his siblings turned it down. Located near Christiana in eastern White Clay Creek Hundred, the farm had come to the family through William's grandmother. He died intestate in 1840. The following year the Orphans Court assigned inspectors who estimated the yearly rental value of the farm at \$150 (Coleman et al. 1984: 49-53). Their evaluation of the farm stated:

On (the) said premises are a rough cast log house two stories high twenty nine by twenty one feet in good order, one frame end adjoining twelve by twenty one feet one story high in good order, one frame kitchen twelve by seventeen feet one story high in good order, one log smokehouse nine by eleven feet in good order, one frame Spring House eleven by eleven feet in good order, one plank granary fourteen by fourteen feet one story high in bad order (and) not worth repair, one log building twenty four by twenty one feet used for Barn and Stable in bad order (and) not worth repair. There is an apple orchard of about one hundred trees, there is no woodland that we think ought to be cleared(.) We estimate about eighty acres of clear land including five acres of meadow, the residue in woodland. We think a new barn with stabling, (a) Granary and (a) CornCrib (are) wanted for the farm(;) probable cost \$450. (New Castle County Orphans Court Records R-1-501) (Coleman et al. 1984: 53-55).

Hawthorn's estate was also inventoried in 1840.

From the entries listing 300 bushels of oats and 300 bushels of corn "subject to the expense of getting out and delivering to market", and the "378 pounds of pickled pork, hams, shoulders, and fletches", it is clear that Hawthorn was still involved in the regional market economy. Home manufacture at the Hawthorn farmstead had lost some of its importance as

shown by the lack of any flannel, tow cloth, or linen in the inventory, and by the listing of "a lot old spinning wheels". Hawthorn was still the owner of a considerable amount of livestock, including a yoke of oxen (his only means of plowing), thirteen "muleys" (i.e., hornless cattle), two heifers, two steers, one bull, three calves, and an "old pale red and white cow". The pickled pork...is obviously related to the "shoats" listed in the inventory. Transportation for Hawthorn and his family was provided for by four horses - two mares, a horse, and a colt (Coleman et al. 1984: 55-56).

Hawthorn's inventory also documents that he had acquired considerably more equipment with which to work his farm than Reed, who owned the Ogletown farm discussed above and who died in 1833. Hawthorn owned a wheat fan and horse rake, carts and wagons, a cultivator and gears, a fallow harrow and plow (all old), hoes, shovels, hay forks, rakes, a scythe and cradle, a wheelbarrow, horse and ox furniture, a grindstone, and wood chopping tools, along with an assortment of bushels, barrels, and casks (Coleman et al. 1984: 233). Tax assessments of the preceding decades had placed the farm's value at close to \$2,000, thus placing Hawthorn in the upper 7% of the hundred's taxables. His inventory, then, is that of a wealthy, productive farmer actively involved in the market economy of the Philadelphia region (Coleman et al. 1984: 57).

Shortly after the Orphans Court appraisers' report, the Hawthorns followed their recommendation and built a new barn and corncrib. The Censuses of Agriculture for 1850-1870 document that the Hawthorns also shifted their agricultural strategy during this period, operating predominantly a dairy farm. The family owned between four and seven milk cows, and produced an average of almost 600 pounds of butter for the market each year. They also raised the typical constellation of field crops for the region and the period, including wheat, oats, buckwheat, Indian corn, Irish potatoes, and sweet potatoes. Apparently by adopting at least some of the practices advocated by area reformers, the Hawthorns increased their productivity per acre from an average of 10 bushels in 1850 to 14 in 1870. In addition, they chose not to invest time and capital in producing garden products or home manufactures for market, although they planted a small orchard of 27 apple trees. Between 1860 and 1870, these trees provided a small cash income. The tax assessments provide supporting documentation of the Hawthorns' success in the agricultural market economy, at least until 1870. Between 1850 and 1870 assessors valued the farm over twice the amount assigned it in preceding decades, or an average of over \$4300 (Coleman et al. 1984: 58, 60). Then, in 1872, the Hawthorns were forced to sell their farm to James Springer for only \$2500, in payment of a debt of \$1500 the Hawthorns owed Springer since 1866. It thus passed out of the family after 136 years (Coleman et al. 1984: 62-63).



In the mid-1840s, George Buchanan purchased a 267 acre farm about two miles north of Smyrna in southern New Castle County (present-day Blackbird Hundred) from his father-in-law.

In 1850, Buchanan's farm consisted of 175 acres of improved land and 85 acres of unimproved land. According to the agricultural census of that year, Buchanan owned 2 horses, 1 ass or mule, 2 milch cows, 2 working oxen, 18 sheep and 4 swine. Buchanan owned farm machinery valued at \$200 and produced over the previous year 260 bushels of wheat, 1600 bushels of Indian corn, and 40 pounds of wool. Other crops included peas, beans, Irish potatoes, buckwheat, and 25 pounds of butter (Grettler et al. 1991: 41-2).

Seven years later Buchanan decided to insure his farm buildings with the Kent Mutual Insurance Company. The policy describes the farm's buildings:

No. 1 A Frame Dwelling house 1 1/2 stories 16 x 20 [feet] with back building 12 x 28 feet situate in Appoquinimink Hundred...estimated value \$600, owned and occupied by the Applicant; warmed by stoves & fireplaces--stove pipes well secured; ashes poured on the ground 60 ft. from building; pump under a back shed 6 feet off. Insured value \$400.

No. 2 A Stable and Carriage house, the main building 18 x 20 feet[,] 16 ft. post, with 2 wings each 12 x 18 ft. 12 feet high; 50 yards from No. 1. Estimated at \$350; insured value \$234. No. 3 is a meal, corn, and tool house 12 x 26 feet 1 story high, 40 feet from No. 1, estimated value at \$75. Insured value \$50 (Grettler et al. 1991: 40).

By 1860 Buchanan had increased the number of milch and neat cattle that he owned to 22 animals. In that year he produced 700 bushels of oats and 300 pounds of butter which represented a twelve fold increase in the amount of butter. This trend towards increased dairy production on the farm continued after George Buchanan's death in 1867... (Grettler et al. 1991: 41-42).

At his death, Buchanan's farm contained only 123 acres. The Orphans Court evaluators described its buildings as consisting of a "two story frame dwelling house, kitchen, tenant house, barn, stable, corn cribs, &c" (Grettler et al. 1991: 37). From 1867 until 1921, family members helped work a 34 acre widow's share of the farm. In the latter year, the Moffitt family purchased the widow's share along with another parcel of the original farm to form a 149 acre property (Grettler et al. 1991: 29-37). The construction of the DuPont Highway during that decade opened up opportunities for local farmers to produce for Wilmington's large urban population. The Highway bisected the Moffitt's farm, however it provided a quick, direct means of transporting perishable dairy

products. By the early 1930s the Moffitts had reorganized their farm, constructing a large complex of structures to support their growing dairy operation.

Although the Census of Agriculture, other official records such as Orphans Court reports, tax assessment records, probate inventories, and insurance policies, surviving architecture, and archaeological evidence have allowed us to sketch the context of agricultural production in New Castle and Kent counties between 1830 and 1880, they have not significantly illuminated the seasonal rhythms of the agricultural year. For this, we can turn to farmers' journals of the period; unfortunately, however, they are not numerous. Richard Mansfield of Achmester Farm in St. Georges Hundred was one successful farmer, agricultural reformer, and community activist who kept a farm journal between the years of 1825 and 1844. A mid-nineteenth-century painting of Achmester farm depicts "an expanse of lawn enclosed by a white picket fence with an entry gate of Mansfield's own design. Towering over the property were poplar and cedar trees... The house had a range of white-washed service buildings including a pyramidal roofed smokehouse" (Herman 1987: 171).

Scholl has analyzed Mansfield's agricultural practices for the years 1830 and 1835. The farm produced principally corn, wheat, oats, clover, and potatoes, the staples of Delaware farmers of the period. Mansfield also harvested turnips and parsnips. Little changed in the times of sowing and harvesting between 1830 and 1835. The planting season began in March with the sowing of corn, potatoes, oats, and clover. April, May, and June were devoted to shearing sheep and slaughtering lambs, harvesting and salting herring, and manuring and plastering the fields. Harvesting oats and clover began in July, allowing a second crop of wheat to be sown on these fields for harvest the following May. Farm workers harvested the potatoes in October, and then spent their time "pulling blades" from the corn stalks for use as animal fodder. Harvesting and husking the corn then kept the farm hands busy until December, when they also assisted in slaughtering and butchering select hogs and cattle. In sum, Mansfield's farm journal records a year round and constant schedule of agricultural activity (Scholl 1992: 5-6).

Research on New Castle and Kent county agriculture and its physical context, the farm, has allowed scholars to outline the temporal and geographical parameters of different approaches to farming and thus different types of farms. In this period, the northern tier of New Castle County hundreds, those in the Piedmont, contained the smallest farms, most under 100 acres (Figure 12). These hundreds' farms engaged intensively in dairying and fattening beef cattle for market, supplemented with raising wheat, and in the middle decades, vegetable crops. Family members provided most of the labor on these farms. By 1850 at least, agricultural machinery

developed by reformers helped these farmers reap substantial profits from their small farms. Immediately to the south, in central New Castle County, large farms dominated the landscape. The good agricultural soils of this region allowed farmers to accumulate considerable estates raising wheat and some vegetables, dairying, and between the mid-1830s and the mid-1850s, harvesting peaches from their often extensive orchards. To operate these large, intensively worked farms, farmers employed the latest agricultural machinery, tenants, and hired farm laborers. Finally, in southern New Castle and in Kent County, mixed subsistence farms predominate through 1880. Corn was the most important field crop, and farmers also raised and marketed comparatively small quantities of wheat, butter, wool (especially before 1850), and meat. After the mid-1850s, many farmers in this region planted peach orchards, which continued to provide profits through the end of this period. Family members, tenants, and seasonal hired laborers worked the farms, with the assistance of little of the machinery used profitably by more northern farmers.

Researchers have also documented the increase between 1830 and 1880 in the number of farms, the percentage of the counties' acreage in agriculture, and the percentage of improved acres on farms. Agricultural reform efforts played a significant role, assisting the counties' farmers in recovering from the crisis of the earlier decades of the century. This transformation of the counties' agricultural economy resulted in a transformation of the cultural landscape of agriculture as well, as Herman and his colleagues and Grettler have documented, especially for the Upper Peninsula. More research is needed on the material culture and the cultural landscape of Piedmont farms. More generally, the economic aspects of agriculture in this period also merits further investigation. Rates of inflation and deflation and their relationship to agricultural productivity, economic cycles, wars, and other cultural factors have yet to be documented and explained. Finally, as the intensive archaeological studies of a small sample of the counties' farms have shown, historical archaeology has much to contribute to an understanding of the life course of individual families and their farms. Without more research of this sort, we cannot be confident that we understand agricultural production in New Castle and Kent counties between 1830 and 1880 in all its variability and complexity.